

REMARKS:

The amendment does not involve new matter. The information added to claim 9 is supported by the previously amended paragraph on page 4, line 25 to page 5, line 10, as well as page 8, lines 1-3.

As a preliminary matter, the Office Action included Applicants' Form PTO 1449 with several of the references crossed off, indicating that they had already been made of record on the Examiner's Form 892 mailed March 3, 2006. However, one of the crossed off references, U.S. Patent No. 5,591,309 to Rugowski, was not previously made of record. The Form 892 listed a similar number, U.S. Patent No. 5,591,305 to Cameron, which may have been mistaken as the reference cited by Applicants. The Examiner is requested to consider U.S. Patent No. 5,591,309 to Rugowski and note the same in a supplemental Form 892.

In the outstanding Office Action, claims 9-22 were rejected under 35 U.S.C. §112, second paragraph, as being vague in use of the term "stitching material." This rejection is respectfully traversed. The term "stitching material" is now explicitly used in the amended text on page 4, line 25 to page 5, line 10. Moreover, the original application is replete with references to the pattern/projections being "stitched" into the carrier, which inherently discloses the use of a stitching material. The term is being used in its general sense, i.e., a material that is used by stitching into a carrier. The term is not vague, and a person of ordinary skill in the art readily understands what the term means, and would be able to tell if a particular method infringed the claims. Furthermore, claims 21 and 22 specify the character of the stitching material, and help to show that the term as used in claim 9 is not vague.

In the outstanding Office Action, claims 9-22 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,814,190 (Phan '190) or U.S. Patent No. 5,820,730 (Phan '730) with or without U.S. Patent No. 5,328,757 (Kenney). This rejection is respectfully traversed. The following, taken in part from the amendment mailed June 5, 2006, responds to this rejection.

Claim 9 is directed to a method for making a tissue sheet having increased bulk and visual aesthetics using a raised pattern felt. The claim calls for forming paper

making fibers into a basesheet; bringing the basesheet into contact with a patterned felt; pressing the basesheet against the patterned felt to form a pattern in the basesheet; and drying the basesheet. In addition, the claim requires that the felt be made from a water-holding substrate joined to a carrier, and that the carrier has the pattern stitched into it, forming a plurality of projections. These projections form the pattern in the basesheet.

Phan '190 and Phan '730 do teach the use of a felt modified to provide a 3-D character to the web. However, both of these patents teach the use of a cured resin to provide the web-contacting structure that gives the web the improved bulk and potentially some aesthetic qualities. Such felts, and their deficiencies, are discussed in the background section on page 2 of the specification.

The previous Office Action, which is incorporated by reference in the present Office Action, takes the position that "The only difference between the method of the cited references and the claimed invention is that the printing elements are not stitched to the base fabric," but that "stitching or needling the imprinting elements onto a base sheet is known in the art and a recognized form of bonding materials and therefore, would have been obvious to one of ordinary skill in the art absent a showing of unexpected results." While stitching and needling are recognized forms of bonding, there is nothing in the cited prior art that shows stitching of an imprinting element. Stitching an imprinting element into a felt is not the same as stitching two materials together. Thus whatever is known about stitching to bond materials together would not make it obvious to form projections in a carrier which is part of a felt used in a wet press papermaking process by stitching. If the Examiner is aware of any prior art that teaches the use of stitching to make such projections used as imprinting elements, he should call it to the Applicants' attention.

Kenney discloses paper making clothing. The previous Office Action asserts that Kenney teaches that papermaking felts can be joined by needling, as well as other techniques. That Office Action further asserts that Kenney evidences "the equivalence of the bonding of the different layers, and thus, the stitching of the layers would have been obvious to one of ordinary skill in the art." Kenney does not, however, suggest any sort of projections, or how such projections could be formed. There is no way that a

person of ordinary skill in the art would look at the elevations 261 made from a photosensitive resin in Phan '190, for example, and think that they could be formed by stitching because of anything taught in Kenney. The different ways that layers of papermaking felts can be joined together as suggested in Kenney is irrelevant to ways of making projections. Thus, claim 9, and the claims dependent thereon, are patentable over the cited references.

Moreover, the use of stitching provides unexpected results compared to other known ways of making projections in a felt used in a wet press papermaking process, and the dependent claims further define over the cited references.

It is well known among papermakers that a key attribute that a felt must provide is the ability to remove water from the web, store it in the felt and ultimately prevent the water from flowing back toward and into the web when the pressure pulse of the pressure-roll nip is removed. These attributes all affect the ability of the felt to dewater the web and hence ensure the high production rate associated with the wet-pressed process. (At the same time, the wet-pressed process generally does not produce the bulk associated with the through dried process, and this is one of the reasons why the present invention is so important.) Unfortunately, using the cured-resin process taught in Phan '190 and Phan '730 causes a solid, impermeable block of material to be placed on the surface of the felt that contacts the web, which impedes the flow of water into the felt. Since the cured resin is a solid "plastic" material, it inherently provides an impediment to the flow of water into the felt. With the increased impediment to the flow of water into the felt, there is a reduction in the dewatering ability of the felt, and hence it's desirability for use in the wet-pressed process.

Additionally, the pattern of the cured resin top, and hence the pattern imprinted into the web, is limited by the patterns that can be readily achieved using the resin-curing process. It is noteworthy that the patterns shown in Phan '190 and Phan '730 are abstract geometric shapes for the examples where the cured resin is applied to a felt rather than a fabric. For example, consider Figure 8 of '730 which deals with a felt for producing high bulk in the wet-pressed process. The resin cured material is in a continuous geometric pattern rather than butterflies (called for by claim 15) or other multiple distinct images (called for by claim 14) that can be constructed via stitching. In

fact, note that Phan '730 teaches the desirability of placing an aesthetically pleasing design, in this case a flower, in the web. However, the aesthetically pleasing design is put in the web in the forming zone via a forming fabric (see column 6, lines 42-47) rather than via the felt.

Similar arguments apply to the Phan '190. Again this patent teaches the same impermeable resin material and a similar geometric pattern as in Phan '730, rather than a pattern made with multiple distinct images, such as butterflies. The felt of Phan '190 would suffer from the same lack of permeability as the felt in Phan '730. Also, examples 3 and 4 of Phan '190 teach the use of the patterned felt, and these two examples use the felt shown in Figures 8A, 8B, and 9B. Again, these embodiments show abstract geometric patterns rather than the multiple distinct images such as butterflies.

The use of the stitched material as claimed provides a key benefit not taught in Phan '190 and Phan '730. Among the advantages of using a felt with a stitched pattern as called for in the present claims is the ability to provide almost any selected aesthetically-pleasing image, including abstract geometric shapes such as those in the various Phan references, or multiple distinct images such as butterflies shown in Figure 1 of the present application. Additionally, the density of the stitching can be altered to provide any combination of permeability and shape. For example, compare sample felts 0 and 1 described on pages 7 and 8, where the yarn density, and hence the permeability of the raised pattern in the basesheet, can be varied as desired.

At a minimum, the use of the hard, impermeable plastic resin must limit the size of the images that can be put on the felt due to blockage of water flow into the felt during the wet-pressing process. In the areas of the fabric where the plastic material is located, it is not possible for water to flow from the web directly into the felt. At a minimum, this water must flow around the plastic material prior to flowing into the web, and this restriction of the water flow must reduce the dewatering capability of the felt. Since the primary purpose of a felt is to allow press dewatering, this has to be a serious problem for relatively large designs. Claim 13 specifically requires that the stitched pattern allows the flow of water through the stitching material into the water holding substrate.

Additionally, the use of the stitched material as called for in claim 9 is conducive to the use of a flow-control material as described in U.S. Patent No. 5,372,876 (Johnson patent). In fact, as called for in claims 18 and 19, the stitched pattern may be formed in a carrier which is a flow-control layer as described in the Johnson patent. Such a structure provides the added benefit of reduced re-wet as the felt leaves the pressure roll nip, and hence increased web consistency. An improvement of even 1% in final consistency, say from 39% to 40%, translates to roughly 5% greater production on a dryer-limited wet-pressed tissue machine.

Finally, the felt called for by claim 9 has one more advantage over the resin-cured technology taught by Phan '190 and Phan '730. One natural consequence of increasing the bulk of a tissue can be a reduction in tensile strength. However, such a reduction is generally undesirable, so there is generally a desire to maintain as much tensile strength as possible while increasing bulk. This is generally achieved in the process described in the present application. Note the tensile strength decreases versus the control are all less than 30% (called for by claim 20), and some are less than 10%. Other techniques, such as embossing an already formed web, typically cause a tensile strength reduction of as much as 50%. This retention of substantial tensile strength is another advantage of the present invention versus the prior art. Since Phan '190 does not provide tensile strength data, it is not possible to predict the tensile reduction caused by that process, but Figures 2, 3, 10, 11 and 16 of Phan'190 show webs that appear to have significant reduction in tensile properties versus the prior art, due to extensive debonding of the web.

The present Office Action does not respond to most of the forgoing arguments and showing of unexpected results. The only response to these arguments in the present Office Action is a statement that there was nothing in the claims that limited the projections of the felt to be formed by the stitching material. While it was the intention that the previous version of the claims required this, Claim 9 has now been amended to specifically recite that the projections of the felt are formed by the stitching material.

For the reasons given above, claim 9, and claims 10-22 dependent thereon, are patentable over the cited references. Further, the dependent claims include additional

limitations not disclosed in, and in some cases contrary to, the teachings of the cited references. Thus those claims are further patentable.

Respectfully submitted,

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